PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

Tutu/mugaha Aspen Girdling Project

BC hydro

BRITISH COLUMBIA

T. L. Martin
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The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

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This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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INTRODUCTION

A manual enhancement project was initiated between Tutu and Mugaha Creeks in 1993 (Figure 1). Treatments include 1) cutting decadent willow to increase browse for wintering ungulates, 2) girdling mature aspen and birch trees to create snags (wildlife trees) for cavity dependent wildlife, and 3) piling coarse felled material to create microhabitats for small mammals, birds and amphibians.

The enhancement site is located approximately 15 km north of Mackenzie in the Sub-boreal Spruce, Moist Cool biogeoclimatic subzone (SBSmk2), Parsnip Trench ecosection. The area ranges from 700 to 900 m in elevation and is characterized by a southwest facing aspect, moderate slopes (10-40%), and deciduous vegetation. Forest cover types for the area include mature aspen-birch stands with some spruce [ABi(S) 631-M], and pockets of non-commercial brush [NCBr-P6] (Appendix 1). Mature aspen and birch trees rise 30 m to dominate the overstory and provide a canopy closure of 35-55 %. Overmature willow (> 10 m) further shadow the lower shrub and herbaceous layers. The lower shrub layer consists of Douglas maple, red osier dogwood, black twinberry, and some younger willow.

METHODS

In 1993, a 1 ha monitoring area was established and targeted for girdling. Prescribed treatments were laid out and a rough trail was cut to the monitoring area in August 1993 by Fraser Corbould and Mari Wood (Peace/Williston Compensation Program) with assistance from a B.C. Hydro Native Environmental Youth Crew (Appendix 2). Trees were marked for future monitoring purposes and to identify their prescription. Willows were flagged with orange ribbon and marked with a wooden stake at their base. Aspen and birch trees were flagged with pink ribbon and marked with an aluminum tag.

Information collected from marked trees included tree number, tree species, tree diameter (dbh; aspen and birch only), number of stems per size category (willow only), stem-yearly growth (willow only), wildlife use and tree condition. A field map with the location of each tree identified for monitoring was also sketched (Appendix 3). In the future, data to be collected on girdled trees will include girdling success (i.e. tree killed), decay rate and use by cavity dependent wildlife. Willows will be assessed for browse use and abundance (number of stems). Monitoring will continue on alternate years over a five year period.

Willows were cut at a height of 60 cm or less and large stems (>7.5 cm in diameter) were bucked into 2 m lengths and piled. Willow tops were cut if it appeared that they would interfere with wildlife movement through the area. Aspen and birch trees were girdled with a chainsaw by removing two strips (2.5 cm wide) of bark encircling the tree that were separated by approximately 15 cm.

Figure 1
Location of Enhancement Site
Map: 93-0/6
Scale: 1: 50,000

RESULTS & DISCUSSION

Eighteen (18) aspen, 3 birch and 30 willows were selected for monitoring and treatment (Tables 1 and 2). Aspen and birch tree diameters averaged 44 cm (s.d. = 8.0 cm) and 25 cm (s.d. = 1.8 cm), respectively. The mean number of stems per willow was 4.8 (s.d. =5.7), with an average of 3.3 stems/willow (s.d. =3.0 stems/willow) for willows $\leq$7.5 cm in diameter (Table 3). Yearly growth for willow stems $\leq$7.5 cm averaged 60 cm in length (s.d. =38 cm; n=46) [Table 2].

Table 1. Trees selected for monitoring and girdling.

Tree No.	Sp.	Diameter	Tree Condition	Comments*
1	At	41.6		
2	Bi	27.2	forks twice at mid-ht	
3	At	68.0		
4	At	42.2		
5	At	35.4		
6	At	47.0		
7	At	46.1	old scars at base	
8	At	48.0	old scars at base	
9	At	44.6		
10	At	42.0	old scars at base	
11	At	42.5	old scars at base	
12	At	38.0	old scars at base	
13	At	31.9	old scars at base	
14	At	48.6	old scars at base	
15	At	34.0	old scars at base	
16	At	41.1	old scars at base	moose foraging on bark
17a	Bi	24.4	forks at 1/3 ht	
17b	Bi	23.8		
18	At	49.5	old scars at base	
19	At	50.3		
20	At	42.5		

Note: all trees were marked with aluminum tags and flagging; flagging was pink except for trees #14, 16 and 18 (pink/black striped).

Cutting overmature willows is intended to promote sprouting, and therefore increase the number of smaller stems ($\leq$7.5 cm) available to browsing wildlife; stems larger than 7.5 cm in diameter are usually inaccessible to browsing moose as they typically exceed 4 m in height. Girdled aspen and birch trees will provide habitat for a variety of wildlife species (dependent on tree diameter and decay stage) that rely on snags, and also sucker and provide browse.

Table 2. Willows selected for monitoring and cutting.

No.	Number of Stems						Years growth (cm)	Browse Sign	Comments
	<0.5cm	0.6-2cm	2.1-7.5cm	7.6-15cm	>15cm	Total			
1					1	1			
2					1	1			
3		5			1	6	45,35,50,15,15	minimal	burnt looking tips
4					1	1			
5					1	1			fissure on S side
6					1	1			
7	5	2			2	9	105,60,50,75		split trunk, one side 2m tall & dead
8					1	1			splits at about 2+ m
9	3	1			6	10	90,75,60,60		split trunk (6)
10	21	2			2	25	30,40,105,90,60	5-10 branches browsed	fallen over
11	1				1	2	55,		2 forks(split)
12					2	2			2 trunks at base (both flagged)
13		1	2		2	5	15,15	all leaders browsed	split into 2, one on grnd,r-o dgwd brwsd
14					1	1			
15					1	1			
16					1	1			
17					2	2			alder (approx. 5cm) at base
18	7				1	8	120,25,45,130	lv's strp'd from < .5cm, some tips blk	poor lf vigour
19				1	1	2			
20	1	1			2	4		winter browsing	
21	1				1	2	105	lv's strp'd from < .5cm	poor lf vigour
22					1	1			
23	8	5			1	14	65,45,15,20,30	winter browse on <2cm stems (40%)	poor lf vigour
24		1			3	4	105,		
25		2	1		1	4	15,80,30	lv's strp'd from younger grwth (10%)	
26	1	1			1	3	30,15	lv's strp'd on young growth	
27					2	2			2 Wi within a group of 5 Wi
28		2			1	3	30,140,		top dead on > 15cm Wi
29	5	2			1	8	105,110,	< .5cm lv's strp'd (50%), winter use	
30	13	4			1	18	65,70,150,45,105	< .5cm lv's strp'd (20%), wntr use (40%)	

Table 3. Size distribution of willow stems.

	Stem diameter size categories					Total
	≤0.5 cm	0.6-2cm	2.1-7.5 cm	7.6-15 cm	>15 cm	
# stems	66	29	3	1	44	143
mean (n=30)	2.2	1.0	0.1	0.0	1.5	4.8
std.dev.	4.7	1.5	0.4	0.2	1.0	5.7

The Mackenzie Fish and Game Association initiated the enhancement work in early September but due to other commitments only a few members were able to work at the site for one day. A total of five trees were girdled (4 aspen and 1 birch) and 2 willows were cut and piled. The group will resume work at the enhancement site in 1994. Monitoring will be conducted in late summer 1995 to allow for at least one growing season after girdling.

RECOMMENDATIONS

1. Ensure that controls for both treatments are established. All marked trees are currently designated to either be cut or girdled, a control group could be established by randomly selecting a few of the marked trees for no-treatment. In this case both groups (treated and untreated) would be comprised of trees monitored in 1993.

2. Carry out both treatments during periods of tree dormancy, if possible. Aspen management projects in the Kootenay Region found that felling aspen in the early spring (prior to leafing) seriously reduced resprouting in the first year (anon., 1993).

3. To ensure success, apply two girdles to birch trees (Coates *et al*, 1990).

REFERENCES

Anonymous. 1993. Internal B.C. Environment letter discussing aspen girdling in Kootenay Region.

Coates, D., S. Haeussler, and J. Mather. 1990. A guide to the response of common plants in British Columbia to management treatments. FRDA handbook 008. Ministry of Forests, Research Branch, Victoria, B.C. 154pp.

APPENDICES

Appendix 1. Forest cover map of enhancement site.

Appendix 2. Location of trail and monitoring site.

Appendix 3. Field map of monitoring site.

Appendix 1
Forest cover map of
Enhancement Site
Map: 930.045
Scale: 1:20,000

Appendix 2
Location of Trail and
Enhancement Site
Photo scale: ≈1:10,000

Appendix 3
Field Map of Enhancement
Site